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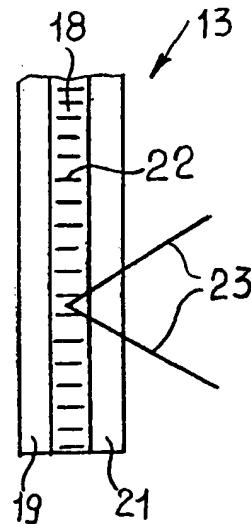
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(54) **Viewing angle restrictor for a visual display unit.**

(55) A protective screen for a visual display unit (11) has a plate (13) which prevents viewing by persons other than those directly in front of the visual display unit.

The plate (13) is fixed in a frame (12) to be positioned in front of the visual display unit (11) by means of tabs of adhesive velcro (27) having a first part (28) which can be fixed to the frame (12) and the second part (29) which can be fixed to the visual display unit (11). The plate (13) comprises a louvre-type film (18) which defines parallel microwindows (22) in order to define a limited viewing angle (23).

**FIG. 3**



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### Field of the Invention

This invention relates to a protective screen for a visual display unit comprising a transparent plate, a supporting frame for the plate and fixing means for fixing the supporting frame to the body of the visual display unit.

### Background of the Invention

A screen of the type defined hereinabove is known, in which the frame can be positioned so as to position the screen adjacent to the visual display unit. This screen protects the user from the glare caused by external light sources. For reasons of confidentiality, it is sometimes necessary to prevent viewing by persons other than those directly in front of the visual display unit.

### Summary of the Invention

Preferred embodiments of the invention provide a protective screen which allows for viewing of the surface of the visual display unit over only a relatively limited angle while preventing viewing by persons outside this angle and which at the same time can be fixed in a simple manner to the body of the visual display unit.

The screen according to the present invention is characterised in that the plate comprises a louvre-type film known per se which defines parallel microwindows in order to define a limited viewing angle and in which the fixing means comprise a first part which can be fixed to the frame and a second part which can be separated from the first part and can be fixed to the visual display unit.

### Brief Description of the Drawings

This and other features of the model are described in the following embodiment given by way of non-limiting example with reference to the accompanying drawings, in which:

- Figure 1 is a front view of a screen embodying the invention in the position of use;
- Figure 2 is a partial longitudinal section of the screen of Figure 1 on a different scale;
- Figure 3 is a partial longitudinal section of a detail from Figure 2 on a different scale, and
- Figure 4 is a front view of a container for housing the screen of Figure 1 on a different scale.

### Detailed Description of Preferred Embodiments

Referring to Figures 1, 2 and 3, a protective screen is designated in general by the reference numeral 6 and is applied to a portable computer 7

of known type which is shown by dash-dotted lines in the drawings and comprises a body 8, a cover 9 and a visual display unit 11 housed in the cover 9.

In this embodiment the screen 6 comprises a supporting frame 12 for a transparent plate 13. The supporting frame 12 comprises a front half shell 14 having a seat 16 provided over the entire edge of the front half shell 14, and a rear half shell 17. A plate 13 has a thickness of approximately 1 mm and comprises an intermediate louvre film 18 of slats of black silicone rubber 25 which form the walls of parallel microwindows 22 of very fine layers of transparent silicone rubber. The film 18 is inserted between two outer plates 19 and 21 of polycarbonate. The combination of the black silicone rubber, the transparent silicone rubber and the thickness of the intermediate film 18 creates a row of microwindows or passages 22 so as to define a viewing angle 23 which varies considerably as a function of the variation in the thickness of the intermediate film 18. The thickness of the film 18 is approximately 60°. The outer plate 21 has its respective outer surface treated so that the coefficient of reflection is minimal. The plate 13 with the frame 12 is rectangular, the base being greater than the height, and has dimensions corresponding to those of the visual display unit 11. The direction of the slats 25 is inclined by approximately 13° with respect to a direction perpendicular to that of the base, although the inclination can vary from 1° to 30°.

The plate 13 is positioned in the seat 16 and is locked to the rear half shell 17 which is positioned against the front half shell 14 and the two half shells 14 and 17 are thus rigidly welded together by means of ultrasonic welding so as to form one piece with the plate 13.

The rear half shell 17 is provided on its two lateral edges with two housings 24 positioned in the vicinity of the upper edge of the half shell 17. In an analogous manner, the front half shell 14 is provided on its two lateral edges with two toothed projections 26. The fixing means 27 comprise two tables of adhesive velcro 28 each having a first element 28 which is positioned and fixed by means of adhesive in the respective housing 24 of the rear half shell 17 and a second element 29 which is positioned and fixed by means of adhesive on the inner part of the cover 9 adjacent to the visual display unit 11, so that the base of the plate 13 is parallel to the base of the said visual display unit 11.

The protective screen 6 is mounted on a portable computer 7 in the following manner. The screen 6 is positioned with the two first elements 28 registering with the two second element 29 and the pressure is applied to the two toothed projections 26 on the front half shell 14 until the elements

28 and 29 are gripped to each other. The screen 6 is thus positioned with the plate 13 in front of the visual display unit 11.

In order to remove the screen 6 from the portable computer 7, the screen 6 is lifted by means of the lower part of the half shell 14 until the elements 28 and 29 of the velcro 27 are freed therefrom.

The protective screen 6 described hitherto and used in the non-limiting example on a portable computer 7 allows for confidential viewing of the visual display unit 11 by only the operator over an angle of 60°, the angle being variable between 30° and 90°. It is thus clear that the operator can operate in any area, such as office, aeroplane, train, etc. with complete confidentiality. Moreover, the protective screen 6 can be applied to any visual display unit of large or small dimensions, thereby allowing for confidential viewing. The inclination of the slats 25 between 1° and 30° moreover prevents the formation of interference fringes on the visual display unit 11.

Once the screen 6 has been removed from the portable computer 7 it can be placed in a container or case 31 (Fig. 4) of nylon fabric having a lower part 32 and an upper part 33. The lower part 32 comprises a central pocket 34 adapted to house the protective screen 6, shown by dash-dotted lines, and two side pockets 36 and 37 of small dimensions to house, e.g. two floppy discs 38, shown by dash-dotted lines, or any other components for use of the portable computer 7. The upper part 33 can be folded along the line 39 in order to engage with a strip of velcro 41 of the lower part 32 in order to keep the container 31 closed. The inner surface of the upper part 33 is rough and moreover has advantageously been stiffened in order to be used as a face for the use of the mouse.

### Claims

1. A protective screen for a visual display unit (11) comprising a transparent plate (13), a supporting frame (14, 17) for the plate and fixing means (28, 29) for fixing the supporting frame to the visual display unit, characterised in that the said plate comprises a louvre-type film (18) known per se which defines parallel microwindows (22) in order to define a limited viewing angle and in which the fixing means comprise a first part (28) which can be fixed to the frame and a second part (29) which can be separated from the first part and can be fixed to the said visual display unit.
2. A protective screen according to claim 1, characterised in that the viewing angle varies

as a function of the variation in the thickness of the film (18).

3. A protective screen according to claim 1 or claim 2, characterised in that the viewing angle is approximately 60° and that the thickness of the film is approximately 1 mm.
4. A protective screen according to any preceding claim, characterised in that the plate (13) with the frame (14, 17) is rectangular, the base being greater than the height, and has dimensions corresponding to those of the visual display unit (11) and that the direction of the slats (25) of the film is inclined by approximately 13° with respect to a direction perpendicular to that of the base of the screen.
5. A protective screen according to claim 4, characterised in that the film is inserted between two outer plates (19, 21) and that the two plates have their surfaces treated so that the coefficient of reflection is minimal.
6. A protective screen according to any preceding claim, characterised in that the frame has a front half shell (14) having a seat (16) provided over the entire edge of the front half shell and two toothed projections (26) projecting from the edge opposite the seat and positioned on two lateral edges in the vicinity of the upper edge of the screen.
7. A protective screen according to claim 6, characterised in that the frame comprises a rear half shell (17) which can be rigidly fixed to the front half shell (14) in order to hold the plate (13) in the seat (16) of the front half shell and that the said rear half shell comprises two housings on the lateral edges opposite the seat in order to house the first part (28) of the said fixing means.
8. A protective screen according to claim 7, characterised in that the toothed projections (26) are opposite the two housings (24).
9. A protective screen according to claim 7, characterised in that the fixing means comprise tabs of adhesive velcro (28, 29) in which the first parts are fixed by means of adhesive in the two housing of the said rear half shell (17) and the second parts are fixed by means of adhesive to the body adjacent to the visual display unit (11), so that the base of the plate (13), is parallel to the base of the visual display unit.

10. A protective screen according to any preceding claim, characterised in that when the screen is not in use it is placed in a fabric container (31) comprising a lower part (32) having a central pocket (34) adapted to house the said screen and two side pockets (36, 37) superimposed upon the central pocket and of small dimensions in order to house floppy discs or elements that can be used by the computer.

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11. A protective screen according to claim 10, characterised in that the container (31) comprises an upper part (33) which is connected to the lower part (32) and can be folded over in order to engage with a fixing element formed by a strip of velcro (40) on the lower part in order to keep the container closed.

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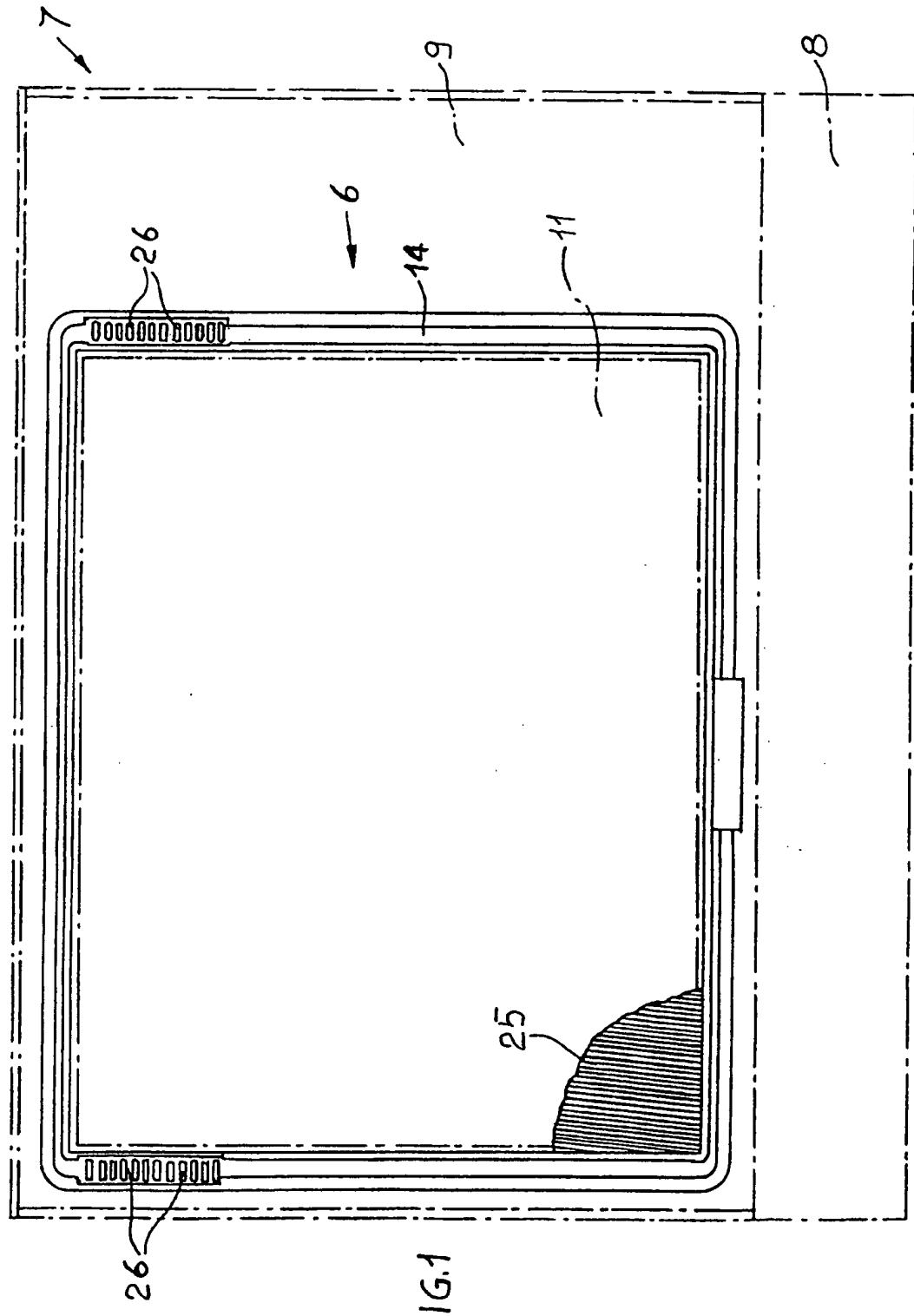


FIG. 1

FIG.2

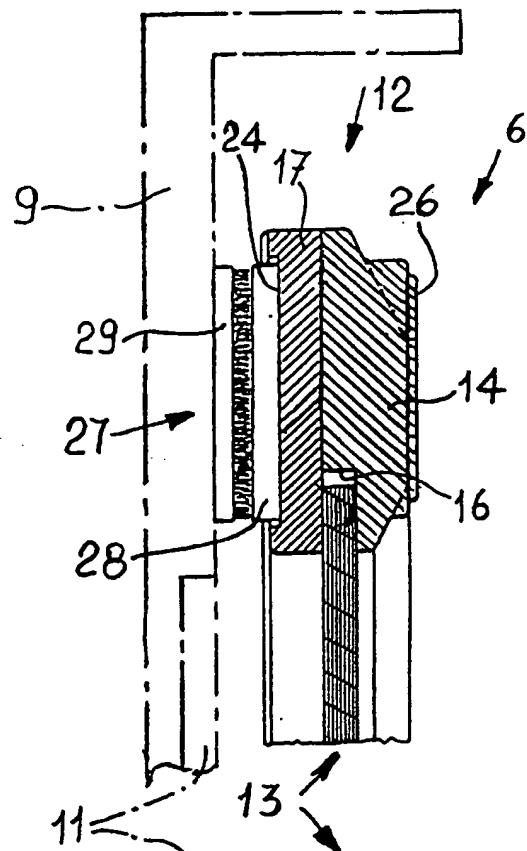
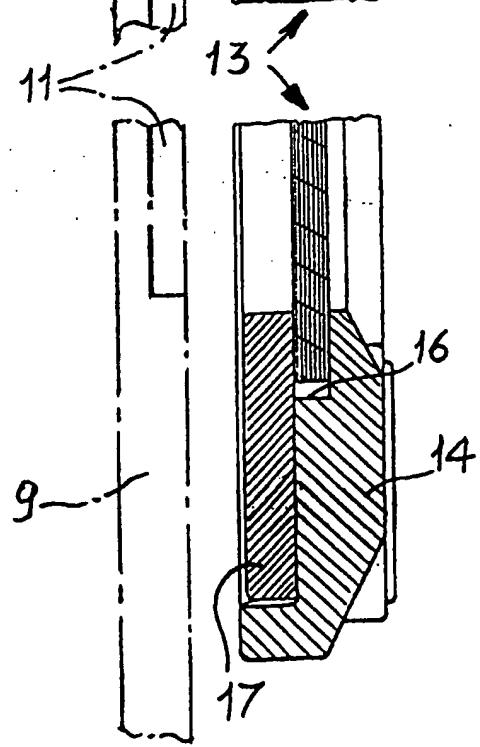
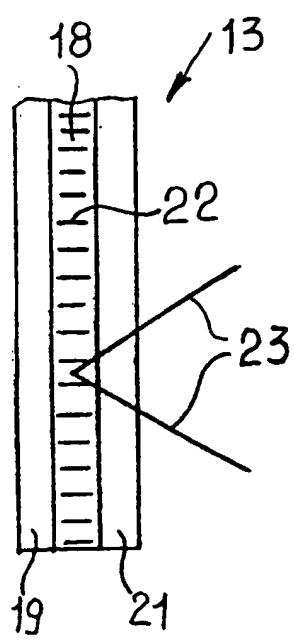


FIG.3



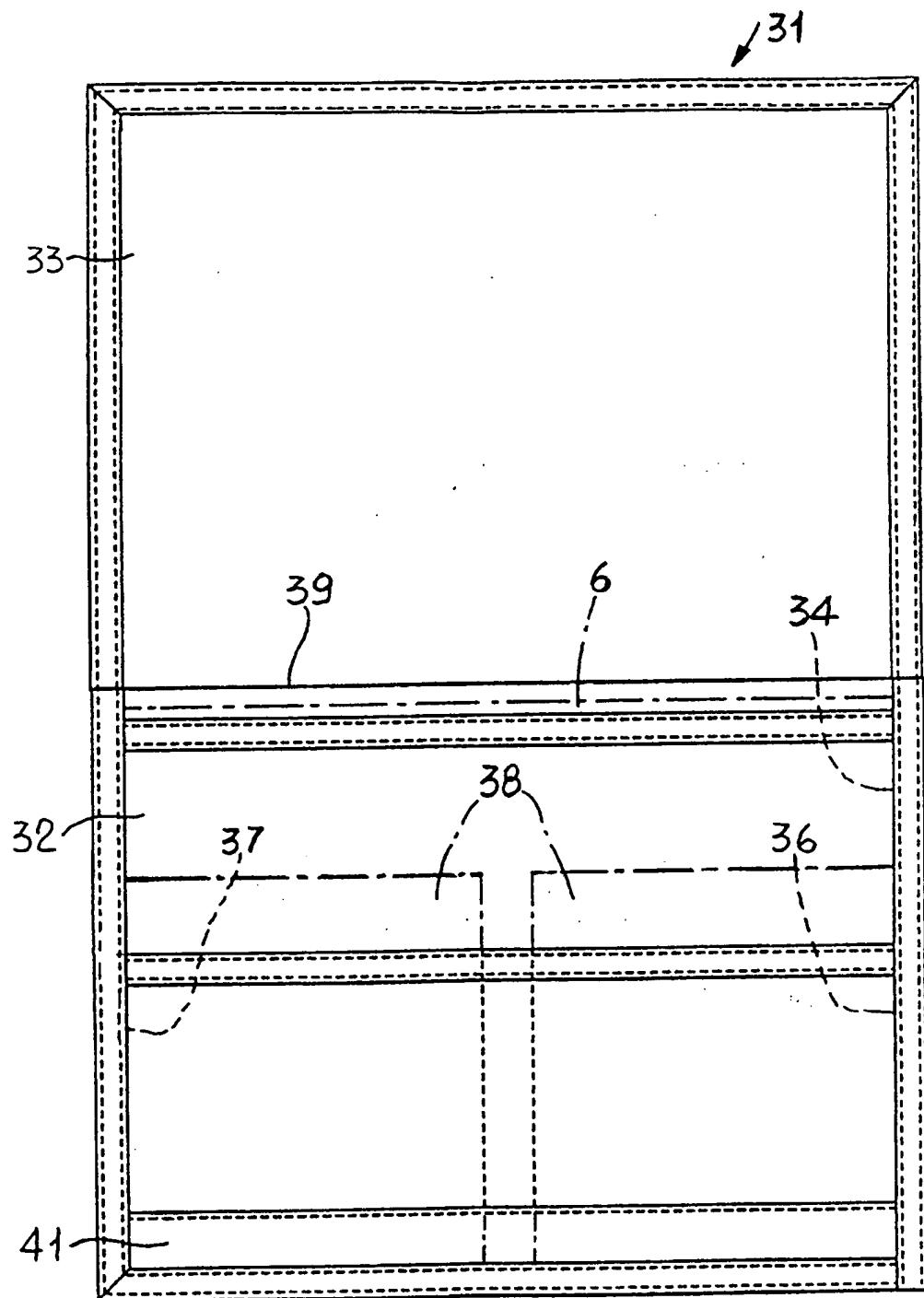


FIG. 4



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## EUROPEAN SEARCH REPORT

Application Number  
EP 93 30 6970

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int.Cl.)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	H01J29/89
Y	GB-A-2 161 983 (GEC (USA)) 22 January 1986	1,2,4,5	H01J29/89
A	* page 1, line 9 - line 14 * * page 2, line 2 - line 19 * * page 2, line 40 - line 45 * * page 2, line 48 - line 91 * * page 2, line 105 - line 118 * * page 2, line 86 - line 92; figures 1,2 * ---	3	
Y	US-A-4 812 709 (E. DUDASIK) 14 March 1989	1,2,4	H01J29/89
A	* column 1, line 16 - line 50 * * column 3, line 34 - line 45 * * column 4, line 46 - column 5, line 24; figures 1,5 *	3	
Y	US-A-4 788 094 (M. MORITA) 29 November 1988	1,2	H01J29/89
	* page 1, line 12 - line 36 * * column 2, line 55 - column 3, line 8; figures 1,2 *		
Y	US-A-4 427 264 (M.KAMERLING) 24 January 1984	1,2,4,5	H01J29/89
	* column 1, line 1 - line 8 * * column 2, line 8 - line 16 * * column 2, line 40 - line 63; figures 1,2 *		
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The present search report has been drawn up for all claims			H01J
Place of search		Date of completion of the search	Examiner
THE HAGUE		3 January 1994	ROWLES, K
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone			
Y : particularly relevant if combined with another document of the same category			
A : technological background			
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T : theory or principle underlying the invention			
E : earlier patent document, but published on, or after the filing date			
D : document cited in the application			
L : document cited for other reasons			
& : member of the same patent family, corresponding document			



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### CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

- All claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for all claims.
- Only part of the claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid,  
namely claims:
- No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

### LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirement of unity of invention and relates to several inventions or groups of inventions,  
namely:

see sheet -B-

- All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims
- Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid,  
namely claims:
- None of the further search fees has been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims,

namely claims: 1-5



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**LACK OF UNITY OF INVENTION A POSTERIORI**

The Search Division considers that the present European patent application does not comply with the requirement of unity of invention and relates to several inventions or groups of inventions, namely:

1. Claims 1-5 : A screen for controlling the viewing angle of a VDU.
2. Claims 6-9 : Details of a frame, and its mounting means.
3. Claims 10-11: A bag for holding computer accessories.